UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/757,926	01/15/2004	Jason A. Trachewsky	BP3186	6339

34399 7590 04/03/2007

GARLICK HARRISON & MARKISON
P.O. BOX 160727
AUSTIN, TX 78716-0727

EXAMINER	
FLORES, LEON	

ART UNIT	PAPER NUMBER
2611	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/03/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/757,926	Applicant(s) TRACHEWSKY ET AL.	
	Examiner Leon Flores	Art Unit 2611	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-11* is/are allowed.

6)☒ Claim(s) *12-18,21-23,25-28 and 30-32* is/are rejected.

7)☒ Claim(s) *19,20,24 and 29* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1. Claims (12, 17, 22-23, 25-27 & 31)are rejected under 35 U.S.C. 103(a) as being unpatentable over Glas (US Patent 6,330,290 B1) in view of Wiss (US Publication 2002/0097812 A1), and further in view of Benner (US Patent 5,848,099).

Re claim 12, Glas discloses a radio frequency integrated circuit (RFIC) comprises: transmitter section operably coupled to convert outbound baseband signals into outbound radio frequency (RF) signals (In Glas, see fig. 2: direct-conversion transmitter, see col. 6, lines 4-6 & 17-21); receiver section operably coupled to convert inbound RF signals into inbound data, wherein the receiver section includes (In Glas, see fig. 2: low-if receiver, and see abstract): a low noise amplifier operably coupled to

amplify the inbound RF signals to produce amplified inbound RF signals (In Glas, see fig. 2: 16, col. 5, lines 39-40); down-conversion module operably coupled to convert the amplified inbound RF signals into baseband in-phase components and quadrature components (In Glas, see fig. 1: 30, and abstract); baseband processor operably coupled to recapture the inbound data from the normalized in-phase and quadrature components (In Glas, see fig. 2: 56, the DSP outputs the data out. This can be seen more clear in figure 1).

But, the reference of Glas fails to specifically disclose orthogonal-normalizing module including: an in-phase power module operably coupled to determine power of the baseband in-phase components; a quadrature power module operably coupled to determine power of the quadrature components; normalizing module operably coupled to normalize the baseband in-phase components and the baseband quadrature components based on the power of the baseband in-phase components, the power of the baseband quadrature components, and the cross-correlation power to produce normalized in-phase components and normalized quadrature components.

However, Wiss does. (See fig. 5: elements 20, 22, 26 & 36, & paragraphs 58-61) Wiss discloses an In-phase and quadrature-phase rebalancer. The system calculates two coefficients that are a function of the gain imbalance and phase imbalance, respectively. The first coefficient depends on the individual power of the In-phase and quadrature-phase components. The second coefficient is a function of the cross-correlation of the IQ components.

Therefore, taking the combined teachings of Glas and Wiss as a whole. It would have been obvious to one of ordinary skill in the art to have incorporated these steps into the system of Glas, in the manner as claimed and as taught by Wiss, for the benefit of providing imbalance compensation.

The combination of Glas and Wiss teaches the limitation as claimed, except they do not specifically disclose orthogonal-normalizing module including: a cross-correlation power module operably coupled to determine a cross-correlation power based on the baseband in-phase and quadrature components.

However, Benner does. (See abstract & col. 8, lines 52-64) Benner discloses a system for testing phase imbalance in QPSK Receivers. The system cross-correlates the sets of I and Q channel data at each of a plurality of relative phase increments, and generates a plurality of cross-correlation energy values in response to said cross-correlation. One skilled in the art would know that power is equal to the change in energy over the change in time, meaning, how energy changes in time will determine how much power the system contains. And vice versa, energy can be computed by integrating power over a time interval.

Therefore, taking the combined teachings of Glas, Wiss & Benner as a whole. It would have been obvious to one of ordinary skill in the art to have incorporated this step of calculating the power of the cross-correlation into the system of Glas, as modified by Wiss, and as taught by Benner, for the benefit calculating the phase imbalance.

Re claim 17, the motivation for combining these references has already been established in claim 12 above, therefore, the combination of Glas, Wiss & Benner further discloses a radio frequency integrated circuit (RFIC) comprises: receiver section operably coupled to convert inbound radio frequency (RF) signals into inbound baseband signals (In Glas, see fig. 2: low-if receiver, and see abstract); transmitter section operably coupled to convert outbound data into outbound RF signals, wherein the transmitter section includes (In Glas, see fig. 2: direct-conversion transmitter, see col. 6, lines 4-6 & 17-21): baseband processor operably coupled to convert the outbound data into the baseband in-phase components and baseband quadrature components (In Glas, see fig. 2: 56, the DSP outputs/inputs the data out/in. This can be seen more clearly in figure 1); orthogonal-normalizing module operably coupled to (In Wiss, see fig. 5): obtain a first coefficient that is based on at least one of a gain imbalance and phase imbalance (In Wiss, see fig. 5: C_o); obtain a second coefficient that is based on at least one of the gain imbalance and the phase imbalance (In Wiss, see fig. 5: C_1); normalize an orthogonal relationship between the baseband in-phase components and the baseband quadrature components based on the first coefficient and the second coefficient to produce normalized in-phase components and normalized quadrature components; up-conversion module operably coupled to convert the normalized in-phase components and normalized quadrature components into RF signals (In Glas, see fig. 2: the lower part of the circuit 140 & 142); and power amplifier operably coupled to amplify the RF signals to produce the outbound RF signals. (In Glas, see fig. 2: 124)

Re claim 22, the combination of Glas, Wiss & Benner further discloses that wherein the orthogonal-normalizing module comprises: a first programmable register for storing the first coefficient (In Glas, see fig. 2: 102 and 56, col. 7, lines 43-47); and a second programmable register for storing the second coefficient (In Glas, see fig. 2: 104 and 56), wherein the first and second coefficients are determined by a trail and error manufacturing test of the gain imbalance and the phase imbalance.(In Glas, see col. 11, lines 25-45 or In Husted, see abstract & paragraph 67)

Re claim 23, the combination of Glas, Wiss & Benner further discloses that wherein the orthogonal-normalizing module comprises: a full matrix multiply module operably coupled to multiply the baseband in-phase components and the baseband quadrature components with a coefficient matrix that includes the first and second coefficients to produce the normalized in-phase components and the normalized quadrature components. (In Wiss, see paragraphs 28-30)

Re claim 25, the combination of Glas, Wiss & Benner further discloses that wherein the orthogonal-normalizing module normalizes the orthogonal relationship between the baseband in-phase components and the baseband quadrature components by: selecting one of the baseband in-phase components and the baseband quadrature components as a reference component (In Wiss, see abstract & claim 8.)

; and normalizing another one of the baseband in-phase components and the baseband quadrature components to the reference component. (In Wiss, see abstract)

Re claim 26, the combination of Glas, Wiss & Benner further discloses that wherein the orthogonal-normalizing module further functions to: update the first and second coefficients to compensate for at least one of temperature variation and aging. (In Glas, see col. 6, lines 24-29. Furthermore, calibration is performed by transmitting a test tone to the receiver. One skilled in the art would know that one of the causes of channel impairments in due to changes in temperature. Therefore, these coefficients must be update to compensate for these impairments.)

Re claim 27, the motivation for combining these references has already been established in claim 12 above, therefore, the combination of Glas, Wiss & Benner further discloses a method for orthogonal normalization of a radio frequency integrated circuit (RFIC), the method comprises: determining phase imbalance and gain imbalance of a transmitter section of the RFIC (In Glas, see fig. 2: lower part of the circuitry 140 & 142); normalizing baseband in-phase components and baseband quadrature components of the transmitter section based on the phase imbalance and the gain imbalance of the transmitter section (In Glas, see fig. 2); coupling the transmitter section to a receiver section of the RFIC in a loop back configuration (In Glas, see fig. 2); providing a test signal from the transmitter section to the receiver section (In Glas, see col. 6, lines 24-27, col. 2, lines 44-45); determining power of baseband in-phase

components, power of baseband quadrature components, and cross-correlation between the baseband in-phase components and the baseband quadrature components of the receiver section while processing the test signal (In, Wiss, see fig. 5: elements 20, 22, 26 & 36, & paragraphs 58-61) (Furthermore, in Glas see col. 6,line 24-25); and normalizing the baseband in-phase components and the baseband quadrature components of the receiver section based on the power of the baseband in-phase components, the power of the baseband quadrature components, and the cross-correlation between the baseband in-phase components and the baseband quadrature components. (In Wiss, see fig. 5)

Re claim 31, the combination of Glas, Wiss & Benner further discloses that repeating the normalizing of the transmitter section and the receiver section to fine tune an orthogonal relationship between the baseband in-phase components and baseband quadrature components of the transmitter section and an orthogonal relationship between the baseband in-phase components and baseband quadrature components of the receiver section. (In Glas, see fig. 2)

Claims (13-16, 30 & 32) are rejected under 35 U.S.C. 103(a) as being unpatentable over Glas (US Patent 6,330,290 B1), Wiss (US Publication 2002/0097812 A1), and Benner (US Patent 5,848,099), and further in view of Husted (US Publication 2003/0206603 A1).

Re claim 13, The RFIC of claim 12, the combination of Glas, Wiss & Benner discloses that wherein the normalizing module comprises: a coefficient module operably coupled to determine coefficients based on the power of the baseband in-phase components, the power of the baseband quadrature components, wherein the baseband in-phase components and the baseband quadrature components are normalized based on the coefficients. (In Wiss, see fig. 5: 20 & 22)

But, the references of Glas, Wiss & Benner fails to specifically disclose a coefficient module operably coupled to determine coefficients based the cross-correlation power. However, Husted does. (See paragraph 78, including equation 14)

Husted discloses a system for passively calibrating and correcting for IQ mismatch in a quadrature receiver. Compensation factors, or coefficients, are utilized to correct the mismatches existing in IQ components. The IQ compensation factors can be used to adjust the magnitude and phase response in the time domain or frequency domain. Please note that the system of Husted only discloses that the cross-correlation factors are included in the coefficients, and not the power of the cross-correlation. However, the reference of Benner teaches this limitation.

Therefore, taking the combined teachings of Glas, Wiss, Benner & Husted as a whole. It would have been obvious to one of ordinary skill in the art to have modified the coefficients to include the cross-correlation power into the system of Glas, as modified by Wiss and Benner, and as taught by Husted, for the benefit of providing compensation for frequency independent phase mismatch (FIPM) between IQ signals. (See paragraphs 67-68)

Re claim 14, The RFIC of claim 12, the motivation for combining these references has already been established in claim 13 above, therefore, the combination of Glas, Wiss, Benner & Husted further discloses that wherein the in-phase power module comprises: a multiplier operably coupled to square the baseband in-phase components to produce squared in-phase values (In Wiss, see fig. 5: 20, paragraph 58); and an accumulator operably coupled to accumulate the squared in-phase values for a predetermined period of time to produce the power of the baseband in-phase components. (In Husted, see fig. 7: 415 & paragraph 64)

Re claim 15, the motivation for combining these references has already been established in claim 13 above, therefore, the combination of Glas, Wiss, Benner & Husted further discloses that wherein the quadrature power module comprises: a multiplier operably coupled to square the baseband quadrature components to produce squared quadrature values (In Wiss, see fig. 5: 22); and an accumulator operably coupled to accumulate the squared quadrature values for a predetermined period of time to produce the power of the baseband quadrature components. (In Husted, see fig. 7: 430 & paragraph 64)

Re claim 16, the motivation for combining these references has already been established in claim 13 above, therefore, the combination of Glas, Wiss, Benner & Husted further discloses that wherein the cross-correlation power module comprises: a multiplier operably coupled to multiply the baseband in-phase components and the

baseband quadrature components to produce cross-correlation values (In Husted, see fig. 7: 408); and an accumulator operably coupled to accumulate the cross-correlation values for a predetermined period of time to produce the cross-correlation power. (In Husted, see fig. 7: 425, paragraph 64)

Re claim 30, the motivation for combining these references has already been established in claim 13 above, therefore, the combination of Glas, Wiss, Benner & Husted further discloses that wherein the determining the power of baseband in-phase components, the power of baseband quadrature components, and the cross-correlation comprises: measuring in-phase signal level of the receiver section while processing the test signal; measuring quadrature signal level of the receiver section while processing the test signal (In Glas, see col. 6, lines 24-27, col. 2, lines 44-45); determining the power of the baseband in-phase components based on the in-phase signal level (In Husted, see fig. 7: 415); determining the power of the baseband quadrature components based on the quadrature signal level (In Husted, see fig. 7: 430); and determining cross-correlation power based on the in-phase signal level and the quadrature signal level.(In Husted, see fig. 7: 425)

Re claim 32, the motivation for combining these references has already been established in claim 13 above, therefore, the combination of Glas, Wiss, Benner & Husted further discloses that in an ordered sequence: coupling the transmitter section to the receiver section in the loop back configuration (In Glas, see fig. 2); providing the test

signal from the transmitter section to the receiver section (In Glas, see col. 2, lines 44-45); determining the power of baseband in-phase components (In Husted, see fig. 7: 415), the power of baseband quadrature components (In Husted, see fig. 7: 430), and the cross-correlation between the baseband in-phase components and the baseband quadrature components of the receiver section while processing the test signal (In Husted, see fig. 7: 425) (In Glas, see col. 6, lines 24-27, col. 2, lines 44-45); normalizing the baseband in-phase components and the baseband quadrature components of the receiver section based on the power of the baseband in-phase components, the power of the baseband quadrature components, and the cross-correlation between the baseband in-phase components and the baseband quadrature components (In Husted, see fig. 7); determining the phase imbalance and the gain imbalance of the transmitter section (In Glas, see fig. 2: 118); normalizing baseband in-phase components and baseband quadrature components of the transmitter section based on the phase imbalance and the gain imbalance of the transmitter section (In Glas, see fig. 2); and repeating the ordered sequence of normalizing of the receiver section and the transmitter section to fine tune an orthogonal relationship between the baseband in-phase components and baseband quadrature components of the receiver section and an orthogonal relationship between the baseband in-phase components and baseband quadrature components of the transmitter section. (In Glas, see fig. 2)

Claims (18, 21 & 28) are rejected under 35 U.S.C. 103(a) as being unpatentable over Glas (US Patent 6,330,290 B1), Wiss (US Publication 2002/0097812 A1), and Benner (US Patent 5,848,099), and further in view of Loper (US Patent 5,249,203).

Re claim 18, the combination of Glas, Wiss & Benner discloses that wherein the orthogonal-normalizing module comprises: a first multiplier module operably coupled to multiple the baseband in-phase components with the first coefficient to produce the normalized in-phase components (In Wiss, see fig. 5: 14); a second multiplier module operably coupled to multiple the baseband in-phase components with the second coefficient to produce cross coupled in-phase components (In Wiss, see fig. 5: 16).

But the references of Glas, Wiss, and Benner fails to specifically discloses a subtraction module operably coupled to subtract the cross coupled in-phase components from the baseband quadrature components to produce the normalized quadrature components.

However, Loper does. (See fig. 5: 103 & col. 12, lines 37-49) Loper discloses a system for controlling for gain and phase errors due to mismatches between signal channels in direct convesion receiver having a pair of signal channels carrying IQ baseband components. The Q component is compensated by multiplying the I component with compensation factor and then substracting the I component from the Q component, as seen in fig. 5)

Therefore, taking the combined teachings of Glas, Wiss, Benner & Loper <u>as a whole</u>. It would have been obvious to one of ordinary skill in the art to have modified

the system of Glas, as modified by Wiss and Benner, as taught by Loper, for the benefit of providing compensation to the Q component signal.

Re claim 21, the motivation for combining these references has already been established in claim 18 above, therefore, the combination of Glas, Wiss, Benner & Loper further discloses that wherein the orthogonal-normalizing module comprises: a first multiplier module operably coupled to multiply the baseband in-phase components with the second coefficient to produce cross coupled in-phase components (In Wiss, see fig. 5: 16); a subtraction module operably coupled to subtract the cross coupled in-phase components from the baseband quadrature components to produce phase adjusted quadrature components (In Loper, see fig. 5: 103 & col. 12, lines 37-49); and a second multiplier module operably coupled to multiply the phase adjusted quadrature components with the first coefficient to produce the normalized quadrature components, wherein the baseband in-phase components are passed as the normalized in-phase components. (In Wiss, see fig. 5: 34. Furthermore, the output of 18 is further multiplied by element 34)

Claim 28 has been analyzed and rejected w/r to claim 18 above.

Allowable Subject Matter

2. Claims 1-11 are allowed.

3. The following is a statement of reasons for the indication of allowable subject matter: The art of record does not suggest the respective claim combinations together and nor would the respective claim combinations be obvious with:

Re claim 1, the further limitation, "a radio frequency integrated circuit (RFIC) comprises: transmitter section operably coupled to convert outbound baseband signals into outbound radio frequency (RF) signals; receiver section operably coupled to convert inbound RF signals into inbound baseband signals, wherein the receiver section includes: a low noise amplifier operably coupled to amplify the inbound RF signals to produce amplified inbound RF signals; down-conversion module operably coupled to convert the amplified inbound RF signals into baseband in-phase components and quadrature components; orthogonal-normalizing module operably coupled to: obtain a first coefficient that is based on at least one of power of the baseband in-phase components, power of the baseband quadrature components, and cross-correlation between the baseband in-phase components and the baseband quadrature components; obtain a second coefficient that is based on at least one of the power of the baseband in-phase components, the power of the baseband quadrature components, and the cross-correlation between the baseband in-phase components and the baseband quadrature components; normalize an orthogonal relationship between the baseband in-phase components and the baseband quadrature components based on the first coefficient and the second coefficient to produce

normalized in-phase components and normalized quadrature components; and baseband processor operably coupled to recapture data from the normalized in-phase and quadrature components". Claims 2-11 depend on claim 1.

4. **Claims (19-20, 24 & 29) are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.**

Re claim 19, the further limitation, *"wherein the first multiplier module comprises: a first plurality of shift registers operably coupled to produce a plurality of shifted representations of the baseband in-phase components; switch matrix operably coupled to pass selected ones of the plurality of shifted representations of the baseband in-phase components and the baseband in-phase components based on the first coefficient; and an adder operably coupled to add the selected ones of the plurality of shifted representations of the baseband in-phase components and the baseband in-phase components to produce the normalized in-phase components".*

Re claim 20, the further limitation, *"wherein the second multiplier module comprises: a first plurality of shift registers operably coupled to produce a plurality of shifted representations of the baseband in-phase components; switch matrix operably coupled to pass selected ones of the plurality of shifted representations of the baseband in-phase components based on the second coefficient; and an adder operably coupled to add the selected ones of the plurality of shifted representations of the baseband in-phase components to produce the cross coupled in-phase components".*

Re claim 24, the further limitation, *"wherein the orthogonal-normalizing module further functions to: measure local oscillation leakage power to produce a first power measurement; provide a first magnitude signal to an in-phase portion of the transmitter section and a zero magnitude signal to a quadrature portion of the transmitter section; measure power of the in-phase portion and power of the quadrature portion while processing the first magnitude signal and the zero magnitude signal, respectively, to produce a second power measurement; provide the first magnitude signal to the quadrature portion of the transmitter section and the zero magnitude signal to the in-phase portion of the transmitter section; measure the power of the in-phase portion and the power of the quadrature portion while processing the zero magnitude signal and the first magnitude signal, respectively, to produce a third power measurement; determine the gain imbalance based on the first, second, and third power measurements; provide a second magnitude signal to the in-phase portion and to the quadrature portion; measure the power of the in-phase and quadrature portions while processing the second magnitude signal to produce a fourth power measurement; provide the second magnitude signal to the in-phase portion and a negative second magnitude signal to the quadrature portion; measure the power of the in-phase portion and the power of the quadrature portion while processing the second magnitude signal and the negative second magnitude signal, respectively, to produce a fifth power measurement; and determine the phase imbalance based on the first, fourth, and fifth power measurements".*

Re claim 29, the further limitation, *"wherein the determining phase imbalance and gain imbalance of a transmitter section comprises: measuring local oscillation leakage power to produce a first power measurement; providing a first magnitude signal to an in-phase portion of the transmitter section and a zero magnitude signal to a quadrature portion of the transmitter section; measuring power of the in-phase portion and power of the quadrature portion while processing the first magnitude signal and the zero magnitude signal, respectively, to produce a second power measurement; providing the first magnitude signal to the quadrature portion of the transmitter section and the zero magnitude signal to the in-phase portion of the transmitter section; measuring the power of the in-phase portion and the power of the quadrature portion while processing the zero magnitude signal and the first magnitude signal, respectively, to produce a third power measurement; determining the gain imbalance based on the first, second, and third power measurements; providing a second magnitude signal to the in-phase portion and to the quadrature portion; measuring the power of the in-phase and quadrature portions while processing the second magnitude signal to produce a fourth power measurement; providing the second magnitude signal to the in-phase portion and a negative second magnitude signal to the quadrature portion; measuring the power of the in-phase portion and the power of the quadrature portion while processing the second magnitude signal and the negative second magnitude signal, respectively, to produce a fifth power measurement; and determining the phase imbalance based on the first, fourth, and fifth power measurements".*

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leon Flores whose telephone number is 571-270-1201. The examiner can normally be reached on Mon-Fri 7-5pm Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Payne can be reached on 571-272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LF
March 8, 2007

David C. Payne
DAVID C. PAYNE
SUPERVISORY PATENT EXAMINER